

SUMMARY OF THE PROJECT

Operational group of the Slovenian national project EIP-AGRI **“The implementation of new mechanical and autonomous automated technologies for the sustainable production of grapes in vineyards”** (main funding source: Rural development 2014-2020 for Operational Groups (in the sense of Art 56 of Reg.1305/2013), project type: Operational group) for your information to introduce you our research work on the project. The project are focusing on to the following products, processes, practices and new technologies:

- ✓ Efficacy of alternative weed control systems without the use of the herbicide glyphosate.
- ✓ Use of hightech modern spraying equipment equipped with LIDAR sensors and DGPS system on the effectiveness of control of diseases and pests of vines.
- ✓ Conservation of biodiversity in the vineyard and its surroundings and
- ✓ Commencement of the measurement practice process ripening of grapes in the vineyard.

In practice **“Efficacy of alternative weed control systems without the use of the herbicide glyphosate”** work group in a large number of selected locations conducts demonstrations of various weed control systems in the rows under the vines.

In practice **“Use of hightech modern spraying equipment equipped with LIDAR sensors and DGPS system on the effectiveness of control of diseases and pests of vines”** work group at several locations (two locations in the eastern and western region) in the vineyard, a demonstration of the application of plant protection products is carried out with the latest spraying technology equipped with LIDAR sensors to continuously regulate the required amount of spray mixture according to the condition of the green leaf area of the vine and other parameters of the vine. In the vineyard, a comparison of the effectiveness of the control of diseases and pests of the vine when using a standard sprayer will be made, which is not equipped with modern sensor technology and a sprayer that is equipped with sensor technology.

In practice **“Conservation of biodiversity in the vineyard and its surroundings”** work group planted wild fruit species, which are rare today both in culture and in nature. The plant species which are the main object of our research through the EIP-AGRI project: white mulberry (*Morus alba*), yellow dogwood (*Cornus mas*), sorghum (*Sorbus domestica*), bream (*Sorbus torminalis*) and black elderberry (*Sambucus nigra*). These wild fruit species will contribute to the increased biological diversity of vineyards. In this way, we will reduce the incidence of diseases and pests, long-term reduction of the carbon footprint.

In practice **“Commencement of the measurement practice process ripening of grapes in the vineyard”** work group at the location of the vineyard, set the beginning of the process of measuring the ripening of grapes, which in the near future will be a powerful tool in the production of typical grapes for the production of top quality wine.

Also, we have established an extensive cooperation network with local farms and stakeholders covering an entire value chain from producers, SMEs, NGOs, advisory services, professional associations to legislators.

POTENTIALS FOR INTERNATIONAL UPGRADING AND PROJECT COOPERATION WITH FOREIGN PARTNERS

Operational group sees great potential for the international upgrade of the EIP-AGRI project in the use of drones for Biodiversity Conservation, Ecological Monitoring and Precision pest management in the vineyards and its surroundings. We are always open for cooperation with foreign partners because we want to share as much experiences in the field related to biodiversity and precision agriculture.

On the topic of the EIP-AGRI project, the research group has so far managed to publish the following research works:

BERK, Peter, URBANEK KRAJNC, Andreja, STAJNKO, Denis, VINDIŠ, Peter, KELC, Damijan, LAKOTA, Miran, BELŠAK, Aleš, POJE, Tomaž, SEČNIK, Matej. Digital evaluation of the green leaf wall area of the vine in the "yellow muscat" variety. V: KOVAČEV, Igor (ur.), BILANDŽIJA, Nikola (ur.). Actual tasks on agricultural engineering : Proceedings of the 48th International symposium Actual tasks on agricultural engineering, Zagreb, Croatia, 2nd - 4th March 2021, (Actual tasks on agricultural engineering (Online), ISSN 1848-4425, 48). Zagreb: University of Zagreb, Faculty of Agriculture, Department of Agricultural Engineering. 2021, pp. 151-159.

BERK, Peter, PAUŠIČ, Andrej, STAJNKO, Denis, URBANEK KRAJNC, Andreja, VINDIŠ, Peter, KELC, Damijan, BELŠAK, Aleš, KOSI, Danijela, LEŠNIK, Mario. Efficiency of alternative weed control systems in the vineyard. V: KOVAČEV, Igor (ur.), BILANDŽIJA, Nikola (ur.). Actual tasks on agricultural engineering : Proceedings of the 48th International symposium Actual tasks on agricultural engineering, Zagreb, Croatia, 2nd - 4th March 2021, (Actual tasks on agricultural engineering (Online), ISSN 1848-4425, 48). Zagreb: University of Zagreb, Faculty of Agriculture, Department of Agricultural Engineering. 2021, pp. 389-399.

BERK, Peter, STAJNKO, Denis, BELŠAK, Aleš, HOČEVAR, Marko. Digital evaluation of leaf area of an individual tree canopy in the apple orchard using the LIDAR measurement system. Computers and electronics in agriculture, February 2020, vol. 169, no. 105158, pp. 1-12, doi: 10.1016/j.compag.2019.105158.

BERK, Peter, BELŠAK, Aleš, STAJNKO, Denis, LAKOTA, Miran, MUŠKINJA, Nenad, HOČEVAR, Marko, RAKUN, Jurij. Intelligent automated system based on a fuzzy logic system for plant protection product control in orchards. International journal of agricultural and biological engineering, 2019, vol. 12, no. 3, pp. 92-102, ilustr. <https://www.ijabe.org/index.php/ijabe/article/view/4476>, doi: 10.25165/j.ijabe.20191203.4476.

BERK, Peter, STAJNKO, Denis, HOČEVAR, Marko, MALNERŠIČ, Aleš, JEJČIČ, Viktor, BELŠAK, Aleš. Plant protection product dose rate estimation in apple orchards using a fuzzy logic system. PloS one, ISSN 1932-6203, April 2019, vol. 14, no. 4, e0214315, <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0214315>, doi: 10.1371/journal.pone.0214315.

STAJNKO, Denis, RAKUN, Jurij, LAKOTA, Miran, VINDIŠ, Peter, BERK, Peter. Development of intelligent automated system for plant protection product control in orchards based on fuzzy logic. V: KATALINIĆ, Branko (ur.). DAAAM International scientific book 2019, (DAAAM International scientific book, ISSN 1726-9687). Vienna: DAAAM International Vienna. 2019, str. 17-32, https://www.daaam.info/Downloads/Pdfs/science_books_pdfs/2019/Sc_Book_2019-002.pdf.